

across the United Kingdom) were consistently less well paid than English women teachers, although they were more highly qualified (Corr, 1997; Hulme, 2011).

ACKNOWLEDGEMENT

I am grateful to Mr James Peacock, Millport, for bringing this postcard to my attention.

NOTES

¹ Keppie, George (aka George Kippie) [(c.1871–1917)]. Photographers of Great Britain and Ireland, 1840–1940 (URL, accessed 17 January 2012, http://www.victorianphotographers.co.uk/index.php/victorian-photographers-k/keppie-george-aka-george-kippie/-p_30356.html).

² Mary Darroch Currie (1878–1936) graduated MA from Glasgow University in 1905. Isabella Blacklock (b. 1869) had been the first female to graduate MA from Glasgow University, graduating in 1895 (URL, accessed 13 January 2012, <http://www.universitystory.gla.ac.uk/alumni/help/finding-graduates/>). Women were only permitted to study at Scottish universities after 1892.

³ A Jemima Wright Downie (1876–1965) graduated MA from Glasgow University in 1902.

⁴ Annie Russell, I know, taught at Kilmarnock Academy.

⁵ Knox, W. W., The Scottish educational system 1840–1940 (URL, accessed 12 January 2012, www.scran.ac.uk/Scotland/pdf/SP2_1Education.pdf).

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Correction to the statistical note in ‘Gulliver, R., 2011. Patterns of flowering on continuously-grazed dune and machair on Colonsay. The Glasgow Naturalist 25 (3) 19–28’

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INTRODUCTION

The data analyses in the article on the phenology of dune and machair communities on Colonsay were correct. However the statistical note in the Methods section was incorrect. The author apologises for this error. A revised set of notes follows.

MAIN TEXT

No overlap between samples; t, z and U test

When there is no overlap between samples (that is, where all the values in one sample are greater in magnitude than all the values in the other) and the data is parametric (that is, the distribution of sample values is well approximated by a Normal distribution), the t or z test should be applied.

For sample sizes of 5 to 20 of non parametric data, and using the form of Mann Whitney U test where the lower of the two U values is the test statistic, it is advisable procedure that a test be applied. However, in these cases the outcome of operating the test is known in advance. The lower value of U will be zero. Reference to the tabulated values of U will show that significance has been obtained and that the null hypothesis can be rejected. For sample sizes of above 20 a formula exists for converting the lower U value to z (Campbell, 1974 p61). For non overlapping samples $n_1=n_2=21$, z has a probability of less than 0.1% using the formula. Hence a very highly significant difference will be obtained in all cases where both n_1 and n_2 are above 20 for non overlapping samples.

For the Mann Whitney U test some tabulated values use the higher of the two U values. Use of the lower value means there is always the same value of U which shows the maximum difference between samples i.e. 0. Use of the upper value means that the values of U associated with maximum difference between samples varies with sample size.

Paired data: the case when the trend in every pair of values is the same throughout; paired t, paired z and Wilcoxon tests

When the trend in every pair of values is the same throughout (i.e. the larger value in each pair always belongs to the same one of the two conditions) for parametric data (where the differences between the two values in each pair give a distribution which is well approximated by a Normal curve), the paired t, or paired z test should be applied.

Where the trend is the same throughout all the pairs of values of non parametric data, for sample sizes of 7 to 25, it is advisable procedure that a Wilcoxon test be applied. However, in these cases the outcome of operating the test is known in advance. The test statistic W (T) i.e. the lower value of R+ or R- will be zero. Reference to the tabulated values of W will show that significance has been obtained and that the null hypothesis can be rejected. For sample sizes of above

25 a formula exists for converting the lower W (T) value to z (Campbell, 1974 p66). For pairs of values when the trend is the same throughout for n=26, z has a probability of less than 0.1% using the formula (n=26 excludes zero differences). Hence a very highly significant difference will be obtained for all paired values of n above 26 when the trend is the same throughout.

Some tabulated values of W (T) use the higher value of R+ or R-. Use of the lower value means there is always the same value of W (T) which shows the maximum difference between the paired replicates i.e. 0. Use of the upper value of R+ or R- means that the values associated with maximum difference between the paired replicates varies with sample size.

Biologists do not always agree on whether data are paired or not. In case of doubt, assume data are not paired.

ACKNOWLEDGMENT

The helpful advice provided by Dr Tim Sparks is gratefully acknowledged. However, the total responsibility for the text rests with the author.

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SUPPLEMENT

The application of a Mann Whitney U test to the case of non overlap on p21 of Gulliver 2011 results in a significant difference being generated, as does the application of a Wilcoxon test to the case of the trend being the same throughout in all pairs of values on p22. NB the median of 23 for 4m² machair quadrats on p21 & p23 is correct, the value in Table 1 should be 23 not 25, author's error.

The most northerly documented record of the green alga *Hydrodictyon reticulatum* (water-net) in the UK

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Strathclyde Loch is located within Strathclyde Country Park, Motherwell (NS 73290 56980) and is designated as a Sensitive Area (Eutrophic) under the Urban Waste Water Treatment Directive, and of poor ecological

potential under current Water Framework Directive (WFD) classification. A macrophyte survey of the loch was carried out in September 2011 by Alison McManus, Thomas Coy and Jan Krokowski (SEPA). This was done as part of SEPA's WFD monitoring and classification. During the survey the invasive nuisance green alga *Hydrodictyon reticulatum* (L.) Bory de Saint-Vincent, 1824 (water-net: Fig. 1) was discovered at one of the sampling points and is believed to be the most northerly documented record of this species in the UK.

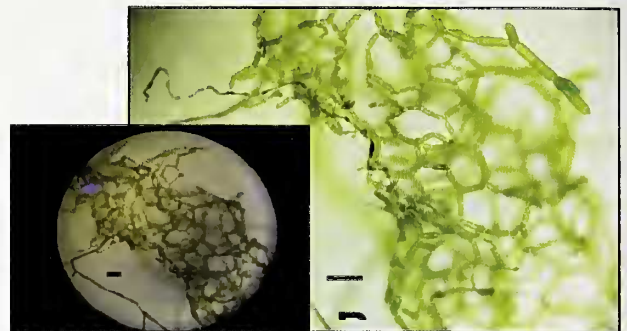


Fig. 1. *Hydrodictyon reticulatum*, Strathclyde Loch, September 2011. Scalebars 100 μ m.

This species is known as a nuisance because it can clog waterways, smother aquatic plants and fauna and adversely impact boating, fishing, swimming and tourism. The spread of this alga is believed to be a response to elevated and extended summer water temperatures (John *et al.*, 1998). The species is confined to downstream sections of waterbodies, partially due to its nutrient requirements, and populations of the alga usually only become obvious in mid-summer, suggesting a need for high temperatures (Whitton, 2000).

It appears that the water-net has become widely distributed over the past two decades and is gradually beginning to colonise more northern waterbodies. Until 2011 the most northern documented records of the species were in Dumfries and Galloway, with other undocumented reports of the species as far north as Aberdeenshire. There are also anecdotal records of the species in Castle Semple Loch, Renfrewshire. The species is well documented in rivers in the Scottish Borders and northern England, especially the Tweed, Tyne, Wear and the Swale.

ACKNOWLEDGMENTS

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